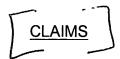
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What is claimed is:

1 1. An optical switching device, comprising:
2 an optical cavity having an input port and an output port; and

a phase modulator disposed within the optical cavity, the phase modulator

4 having an input port and an output port respectively coupled to the input port and

5 the output port of the optical cavity,\wherein the phase modulator introduced a

phase shift in a portion of an optical signal propagating in the optical cavity while the

component signal is propagating in one direction, and introduces a phase shift in

8 another portion of the optical signal propagating in another direction.

1 2. The optical switching device of claim 1, wherein the phase modulator

comprises a Mach-Zehnder interferometer (MZI).

1 3. The optical switching device of claim 2, wherein the phase modulator

2 comprises an electro-optic phase shifter.

1 4. The optical switching device of claim 2, wherein the phase modulator

2 comprises a thermo-optic phase shifter.

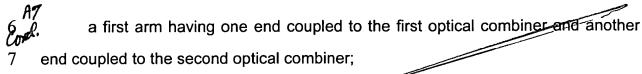
1 5. The optical switching device of claim 2, wherein the phase modulator

2 comprises a stress-optic phase shifter.



- 6. The optical switching device of claim 2 wherein the MZI comprises a
- 2 Y-coupler
- 1 7. The optical switching device of claim 2, wherein a first reflective facet and a
- 2 second reflective facet are used in implementing the optical cavity.
- 1 8. The optical switching device of claim 7, wherein the first facet comprises a
- 2 coating having a plurality of adjoining layers, each layer having an index of
- 3 refraction that is different from that of an adjoining layer, the refractive indices
- 4 alternating between higher and lower refractive indices.
- 1 9. The optical switching device of claim 7, wherein the first facet comprises a
- 2 reflective grating.
 - 210. An optical switching device, comprising:
- an optical cavity having an input port and an output port; and
- means, disposed within the optical cavity, for modulating a phase of a portion
- 4 of an optical signal propagating in the optical cavity.
- 1 11. The optical switching device of claim 10, wherein the means for modulating
- 2 comprises a Mach-Zehnder interferometer (MZI).
- 1 12. The optical switching device of claim 11, wherein the means for modulating
- 2 comprises an electro-optic phase shifter.

- 1 13. The optical switching device of claim 11, wherein the means for modulating
- 2 comprises a thermo-optic phase shifter.
- 1 14. The optical switching device of claim 11, wherein the means for modulating
- 2 comprises a stress-optic phase shifter.
- 145 15. The optical switching device of claim 11 wherein the MZL comprises a
- 2 <u>Y-coupler.</u>
- 1 16. The optical switching device of claim 11, wherein a first reflective facet and a
- 2 second reflective facet are used in implementing the optical cavity.
- 1 17. The optical switching device of claim 16, wherein the first facet comprises a
- 2 coating having a plurality of adjoining layers, each layer having an index of
- 3 refraction that is different from that of an adjoining layer, the refractive indices
- 4 alternating between higher and lower refractive indices.
- 1 18. The optical switching device of claim 16, wherein the first facet comprises a
- 2 reflective grating.
- 1 19. A planar optical integrated optical circuit, comprising:
- 2 a first facet having a reflectance less than one;
- a second fact having a reflectance less than one'
- 4 a first optical combiner coupled to the first facet;
- a second optical combiner coupled to the second facet;



- a second arm having one end coupled to the first optical combiner and another end coupled to the second optical combiner; and
- a phase shifter operatively coupled to the first and second arms.
 - 1 20. The planar optical integrated optical circuit of claim 19, wherein the first and
 - 2 second facets each comprise a reflective grating.
 - 1 21. The planar optical integrated optical circuit of claim 19, wherein the phase
- 2 shifter is an electro-optic phase shifter, a thermo-optic phase shifter, or a stress-
- 3 optic phase shifter.

1 22. A-method, comprising:

- 2 propagating an optical signal into an optical cavity;
- causing a portion of the optical signal to propagate in one optical path and another portion of the optical signal to propagate in another optical path;
- selectively introducing a phase difference between the portions of the optical signal;
- 7 combining the portions of the optical signal; and
- 8 propagating a portion of the combined signal out of the optical cavity.
- 1 23. The method of claim 22, wherein the optical cavity is a resonant optical cavity
- 2 with respect to the optical signal.

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- 1 24. The method of claim 22 wherein a reflective grating is used to form a part of
- 2 the optical cavity.
- 1 25. The method of claim 22, wherein a Mach-Zendher Interferometer (MZI) is
- 2 used to selectively introduce the phase difference.
- 1 26. The method of claim 25, wherein the MZI comprises a phase shifter selected
- 2 from the group comprising an electro-optic phase shifter, a thermo-optic phase
- 3 shifter, or a stress-optic phase shifter.
- 27. An optical switching device, comprising:
- 2 an optical cavity;
- means for propagating an optical signal into the optical cavity;
- means for causing a portion of the optical signal to propagate in one optical path and another portion of the optical signal to propagate in another optical path;
 - means for selectively introducing a phase difference between the portions of the optical signal;
- 8 means for combining the portions of the optical signal; and
- 9 means for propagating a portion of the combined signal out of the optical 10 cavity.
 - 1 28. The optical switching device of claim 27 wherein a reflective grating is used to
- 2 form a part of the optical cavity.
- 1 29. The optical switching device of claim 27, wherein the means for selectively
- 2 introducing a phase difference comprises a Mach-Zendher Interferometer (MZI).





- 1 30. The optical switching device of claim 29, wherein the MZI comprises a phase
- 2 shifter selected from the group comprising an electro-optic phase shifter, a thermo-
- 3 optic phase shifter, or a stress-optic phase shifter.